



# Defining OBS standards



## Overview

- For OBS data to be fully exploited, it should:
  - Be available to the largest audience
  - Have its particularities well documented
  - Have open source, easy-to-use processing tools
- From 3/2024 to 2025, the FDSN “OBS data standards” Action will:
  - Define standards
  - Develop/recommend tools
- These standards will be proposed to the FDSN at the summer 2025 IASPEI workshop
  - To be integrated into the miniSEED and StationXML documentation
  - Plus a separate document/website



# FDSN Action for OBS meta/data standards

- Action Group
  - Members
    - N America: J Collins (WHOI, OBSIC), J Simon (Princeton, FDSN WG5 chain), J Carter (EarthScope), K Aderhold (EarthScope)
    - Europe: W Crawford (IPGP, ORFEUS Mobile Instr WG), C Corela (U Lisbon), S Hemmleb (GFZ Potsdam)
    - Asia: Y Ai (IGGCAS, FDSN WG5 Vice-chair)
    - Room for other regions!
  - Bi-monthly meetings to discuss proposed modifications
    - First meeting was in March 2024
- Collaborative workspace
  - <https://github.com/FDSN/OBS-standards/>
  - Anyone can submit “Issues”



## Two main files

- standards.md: meta/data standards
- users.md: available software

### obs-specific information

The StationXML format (v1.2) has no intrinsic elements for storing OBS-specific information. This information should be stored in a structured metadata file with a public-published format.

We propose to use obsinfo "[subnetwork](#)" files, which allow the storage of essential information about deployments without going into instrument-level details.

These files can be used with obsinfo instrumentation files to generate [FDSN StationXML](#) files with embedded OBS-specific information, or they can be used to fill in information in StationXML files generated using other tools.

### processing steps

Processing done on data files (from data download to delivery to the data center) should be recorded in text-based, structured files. The JSON process-steps format ([LINK](#)) is an example.

### Source Identifiers

The following source-subsource codes (see [FDSN Source Identifiers documentation](#)) should be used for the following types of sensor/data:

code	description
1	Unoriented seismometer, "N" channel equivalent
2	Unoriented seismometer "E" channel (+90 degrees from "1")
3	Seismometer/geophone with inverted vertical channel (positive voltage is down)
DH	Hydrophone
DG	Differential pressure gauge
DO	"Absolute" bottom pressure recorder

### Station names for repeated deployments

If OBSs are deployed repeatedly at one site (to make a long series), use an incrementing alphanumeric character at the end of the station name (i.e., A01A, then A01B then A01C for subsequent deployments at the same approximate location). This may be a *de facto* "standard", but I haven't seen it written down

### Metadata (StationXML)

See StationXML Reference for details of StationXML elements



## Files

- standards.md:
  - **Recording deployment information** and creating StationXML files
  - **Recording processing steps**
  - Channel naming
  - Station naming for repeated deployments
  - Metadata
    - **Recording clock drift**
    - **Orientation standards (inc hydrophones)**
    - **Deployments in lakes**
    - Position precision
    - Leap seconds
    - Data completeness
  - Data
    - **Clock drift correction and codes**
    - Leap seconds
- users.md:
  - Calculating/confirming **clock drift**
  - Calculating sensor **orientations**
  - Removing **noise**
  - Extracting **active seismic data**
  - **Precise positioning** of the OBS



# Submitting issues

github.com/FDSN/OBS-standards/tree/

FDSN / OBS-standards

<> Code **Issues 2** Pull requests Actions Projects Wiki Security

OBS-standards Public Edit Pins Unwatch 7 Fork 0 Star 0

main Go to file + <> Code

WayneCrawford Update standards... 3e7cb05 · last month 30 Commits

File	Update	Time
Meetings	Update TimeZones.md	last month
References	Update README.md	last month
README.md	Update README.md	last month
preamble.md	Update preamble.md	3 months ago
standards.md	Update standards.md	last month
users.md	Update users.md	last month

About: A repository for the discussion an development for Ocean Bottom Seismology standards

Releases: v0.1 Latest on Mar 11

github.com/FDSN/OBS-standards/issue

FDSN / OBS-standards

<> Code **Issues 2** Pull requests Actions Projects Wiki Security

Label issues and pull requests for new contributors Dismiss

Now, GitHub will help potential first-time contributors discover issues labeled with good first issue

Filters is:issue is:open Labels 9 Milestones 0 **New issue**

2 Open 2 Closed

Issue	Author	Label	Projects	Milestones	Assignee	Sort
<input type="checkbox"/> Location codes to specify time-shifted data	joelsimon					1
<input type="checkbox"/> Add OBS-specific parameters using external namespace?	WayneCrawford					



## New tools

- Will be integrated into the standards and users documents
  - msmod upgrade to correct for piecewise linear clock drift
  - obsinfo tool to transform deployment-specific metadata into StationXML
- If you have a new (or existing) tool that is not documented in users.md, please inform us (Issues page, or an email!)



## What can you do?

- Look at the [standards.md](#) and [users.md](#) files on the github website
  - Use them if you creating data/metadata
  - Make comments and suggestions for improvements/additions using the “issues” tool
- Package your useful tools for easy distribution and use, and inform the Action Group
- Join the Action Group if you are from an under-represented region